



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,745	03/21/2006	Toshikazu Takada	0403730375	3314
23428 7590 03/30/2010 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				
EXAMINER				
DEJONG, ERIC S				
ART UNIT		PAPER NUMBER		
1631				
MAIL DATE		DELIVERY MODE		
03/30/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/572,745

Applicant(s)

TAKADA ET AL.

Examiner

ERIC S. DEJONG

Art Unit

1631

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED OFFICE ACTION

Applicants response filed 01/04/2010 is acknowledged.

Claim 14 is cancelled. Claims 15-19 are newly presented. Claims 1-13 and 15-19 are pending and currently under examination.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claim Rejections - 35 USC § 101

The rejection of claims 1-6 and 13 under 35 USC 101 as being directed to non-statutory subject matter is withdrawn in view of amendments made to the instant claims.

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 19 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. This rejection is necessitated by applicants amendment to the instant claims.

The recent en banc decision regarding *Bilski v. Warsaw* (2008) set forth that a process is patent-eligible if (1) it is tied to a particular machine or apparatus or (2) it transforms a particular article into a different state or thing. Further, the recent decision in *Comiskey* (2009) confirmed the opinion set forth in *Bilski* of the prohibition pre-empting an abstract idea or mental process in a claim. The revised *Comiskey* decision further reiterated the precedent set forth in *Richman*, 563 F.2d 1026, 1030 (CCPA 1977) wherein the court held the application unpatentable because "if a claim [as a whole] is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory."

In the instant case, the claim 19 is directed to a method for executing calculation of a Hartree-Fock method in a molecular orbital. The recited process comprising dividing a density matrix into multiple submatrixes, distributing and storing the submatrixes, and executing calculation processes on the multiple density submatrixes. However, the recited process does not involve any transformation of a particular article into a different state or thing. Rather, the instant claims are directed to abstract data manipulation and mathematical operations on an unspecified density matrix. Therefore, the examiner must determine if the instant claims are tied to a particular machine or apparatus. It is acknowledged that the instant claims recite using "a plurality of computers" to perform the recited matrix operations, however this only suggests the involvement of a general purpose computer in carrying out the recited process and does not specify any particular structure or machine or apparatus elements that are required in order to carry out the recited process. As such, the instant claims are directed

essentially to a method of calculating and performing a mathematical operations, and, therefore, said claims are directed to nonstatutory subject matter.

Claims 1-13 and 15-19 are rejected under 35 U.S.C. 101 because the claimed invention is lacks patentable utility. This rejection is necessitated by applicants amendment to the instant claims.

The instant claims are drawn to a method, and the related computer program and system, of using a computer cluster, dividing a density matrix into multiple submatrixes, and executing calculation processes. While it is acknowledged that the preamble of the independent claim 1 suggests calculations of the Hartree-Fock method in a molecular orbital, the instant claims do not recite any positive limitation that would limited the executed "calculation processes" to a Hartree-Fock method. Rather, the instant claims are generic with respect to the types of calculation processes that are encompasses by the recited method, program, and systems. The instant claims do not recite any limitation directed to the "molecular orbital" that a density matrix is derived from, nor the type of molecular systems that the recited computational processes. Further, the instant claims do not recite any particular improvement or how the recited calculation processes would be used to yield any useful information that can be considered to have both a specific and a substantial utility. As such, the instant claims are generic with regard to what molecules or class of molecules systems the recited "calculation processes" operate on or what particular molecular characteristics and/or features would be identified by a practitioner of the claimed invention.

The Court of Patent and Appeals has stated:

"Practical utility is a shorthand way of attributing "real-world" value to claimed subject matter. In other words, one skilled in the art can use a claimed discovery in a manner which provides some immediate benefit to the public." A 'use' to do further research is not considered a utility which provides an "immediate benefit" to the public.

Examples of situations requiring further research to identify or reasonably confirm a "real world" context of use, and which do not have utility under 35 USC 101, as set forth in MPEP 2107.01.1, include:

- (A) Basic research such as studying the properties of the claimed product itself or the mechanisms in which the material is involved,
- (B) A method of treating an unspecified disease or condition,
- (C) A method of assaying for or identifying a material that itself has no specific and/or substantial utility,
- (D) A method of making a material that itself has no specific, substantial and credible utility, and
- (E) A claim to an intermediate product for use in making a final product that has no specific, substantial, and credible utility.

In the instant case, practicing the claimed invention results only in the execution of unspecified calculations employing an art recognized Hartree-Fock modeling of molecular orbitals coupled together with recited use routine parallel computing computers and processing as the vehicle by which said calculations are carried out. The instant claims are not limited to any particular molecule or field of study, but rather to carrying out an art recognized Hartree-Fock modeling approach applied to an unspecified molecular system of interest. Such amounts to basic research on an unspecified molecule or molecular systems so as to investigate any potential properties thereof. As noted in the utility guidelines (see Federal Register, December 21, 1999, Vol. 64, No. 244), basic research directed only towards potential properties fails to provide an immediate benefit to the public or practical utility. Therefore, the instant claims do not have a specific or substantial utility.

Claim Rejections - 35 USC § 112

The rejection of claims 8-12 under 35 USC, 112, 2nd paragraph are withdrawn in view of amendments made to the instant claims.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13 and 15-19 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention. This rejection is necessitated by applicants amendment to the instant claims.

Response to Arguments

Applicant's arguments filed 01/04/2010 have been fully considered but they are not persuasive.

In regards to the rejection of claims under 35 USC 101 as being directed to non-statutory subject matter, applicants attention is directed to the new grounds of rejection regarding claim 19 for the same reasons set forth in the previous Office action. Newly presented claim 19 does not contain the new limitations added to the previously presented claims that overcome the previous grounds of rejection on the basis of non-statutory subject matter. Further, Applicants have not point to any other recited features

of claim 19 that would overcome the instant rejection, newly applied in view of amendments made to the instant claims.

In regards to the rejection of claims under 35 USC 101 because the claimed invention is lacks patentable utility (and the related rejection under 35 USC 112, 1st for lack of enablement), applicants only respond only by stating there is clear patentable utility in the presently pending claims.

In response, applicants argument amounts to an assertion that the claims have patentable. In the instant case, it is maintained the claimed invention does not present any specific and substantial utility that would satisfy the utility requirement under 35 USC 101. In the instant case, practicing the claimed invention result only in the execution of unspecified calculations employing an art recognized Hartree-Fock modeling of molecular orbitals using routine parallel computing computers and processing as the vehicle by which said calculations are carried out. The instant claims are not limited to any particular molecule or field of study, but rather to carrying out unspecified computations on an unspecified system of interest. Such amounts to basic research on an unspecified molecule or molecular systems so as to investigate the potential properties thereof. As noted in the utility guidelines (see Federal Register, December 21, 1999, Vol. 64, No. 244), basic research directed only towards potential properties.

Further, the instant specification does not teach that applicants are the first to derive the Hartree-Fock modeling approach for calculations involving molecular orbitals.

Therefore the instant claims do have a specific or substantial utility on this point of merit because one of skill in the art is already has at their disposal the knowledge and capability of performing Hartree-Fock modeling approach for calculations involving molecular orbitals. Further, the instant specification does not assert that applicants are the first to arrive at computational processes being carried out in parallel using a plurality of computer or computer systems. Therefore the instant claims do not have a specific or substantial utility on this point of merit because one of skill in this art already has at their disposal the knowledge and capability of adapting any series of mathematical/formulaic calculations into a parallel computing steps. Therefore, the examiner maintains that the instant claims lack patentable utility.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC S. DEJONG whose telephone number is (571)272-6099. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIC S. DEJONG/
Primary Examiner, Art Unit 1631